

What is claimed is:

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8. The method according to claim 1, further including actively controlling the amount of fluid introduced into the vacuum chamber based upon a parameter measured in the chamber.

9. The method according to claim 8, further including selecting the parameter from the group consisting of pressure, water vapor/ion concentration, and temperature.

10. The method according to claim 8, wherein the parameter includes a measurement of an ion beam current.

11. The method according to claim 10, wherein the measurement includes a measurement of a decrease in the beam current due to the fluid in the chamber.

12. A method of processing a substrate, comprising:
placing the substrate into a vacuum chamber;
evacuating the vacuum chamber to a first pressure;
introducing a fluid into the vacuum chamber; and
implanting ions into the substrate using an ion beam to form a buried oxide layer under a top silicon layer;
measuring a decrease in the ion beam current level due to the fluid in the chamber; and
adjusting the fluid level based upon the measured ion beam current level.

13. The method according to claim 12, further including the step of selecting the fluid from fluids that inhibit formations of threading dislocations in the top silicon layer for reducing a defect density of the processed substrate.

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